March 1, 1932. E. G. HUZENLAUB 1,847,946

WASHING MACHINE

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FIG. 1.

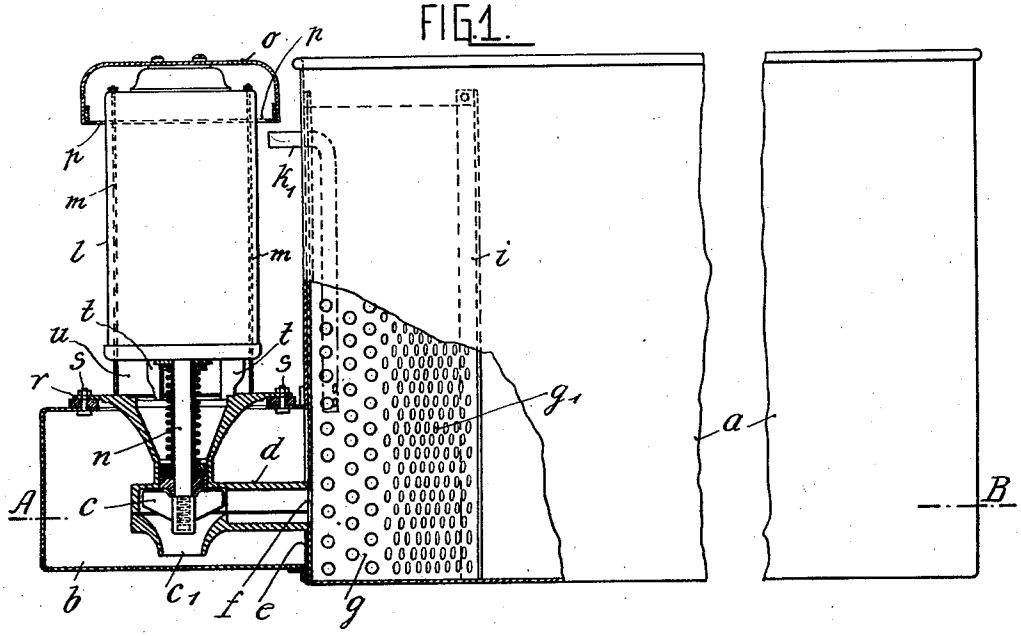
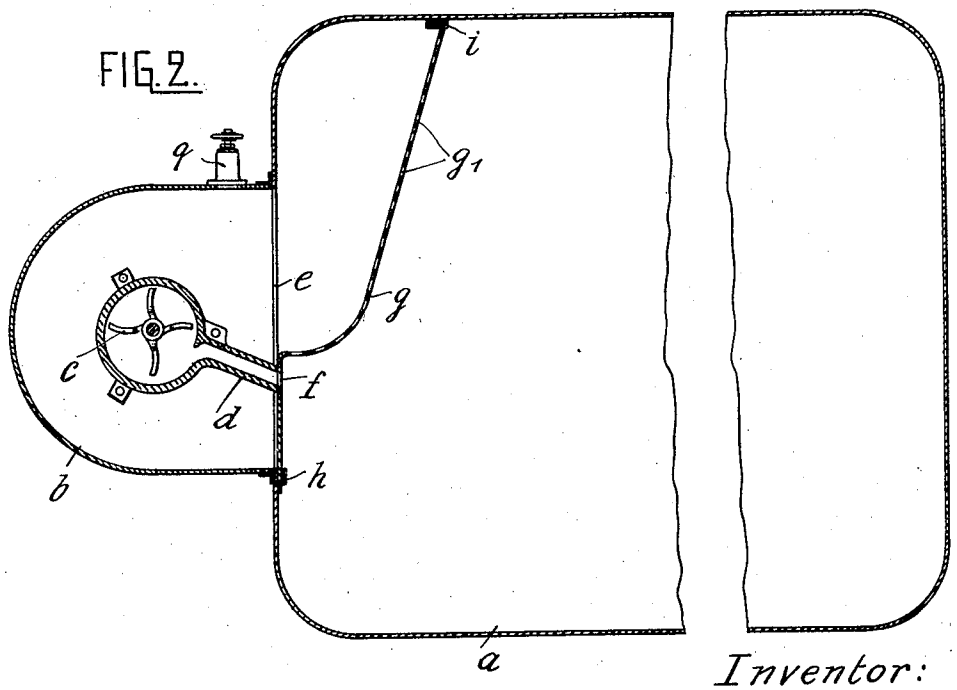


FIG. 2.



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FIG. 4.

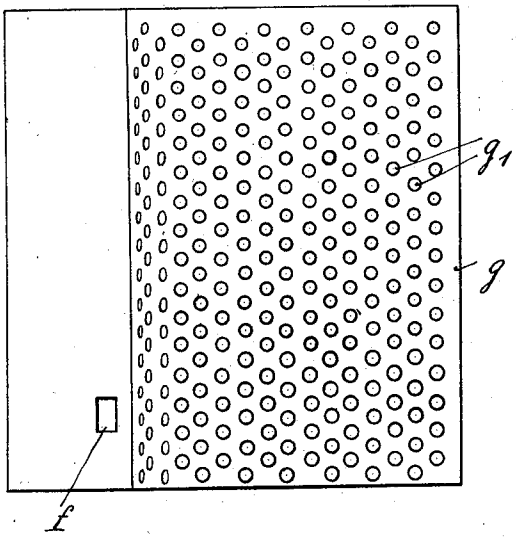
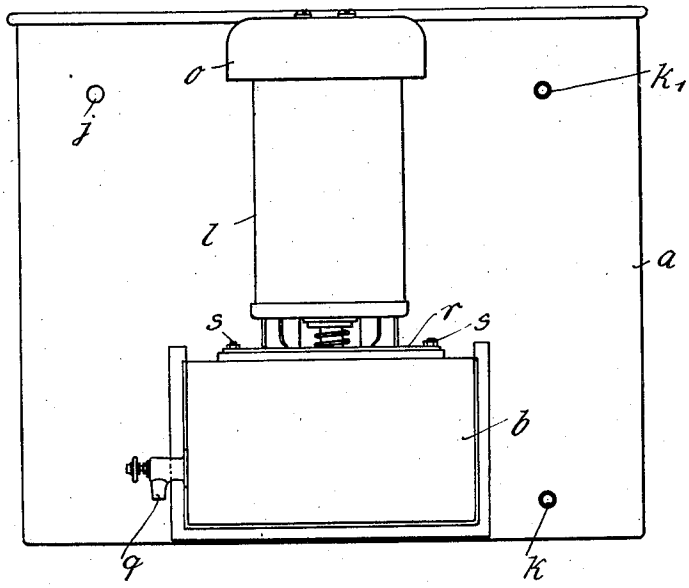


FIG. 3.



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Patented Mar. 1, 1932 1,847,946

UNITED STATES PATENT OFFICE

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WASHING MACHINE

Application filed February 8, 1930, Serial No. 426,789, and in Germany August 9, 1929.

This invention relates to washing machines, and more particularly to washing machines having a circulating pump associated therewith permitting to properly rotate the laundry contained in the wash-tub of the machine without the use of any mechanical agitating means, twirling devices or the like. As well known, the advantage of such washing machines consists therein that the laundry, in spite of its being lively moved and thoroughly agitated, does not come into contact with any movable fixed members which could cause injuries but solely with the smooth walls of the container or wash-tub. Also, such washing machines, as known, may be manufactured conveniently and at small cost.

My invention consists in the first place in making the cross-sections of the suction and discharge aperture of the pump circuit which drives the washing liquid through the laundry and rotates the latter within the tub of considerably different areas. More particularly, according to my invention the clear width of said discharge aperture is made to amount to approximately one-fiftieth or less of said suction aperture. By reason of these considerably different cross-sectional areas of the suction and discharge aperture of the pump circuit, apparently also the velocity of the liquid passing through the pump will be essentially different at said apertures and the washing liquid will be caused to enter the wash-tub in the form of a sharp jet having only a small diameter but an extremely high velocity.

My invention consists furthermore in arranging the water discharge aperture of the pump circuit in such a manner that the jet of water discharged from said aperture will be obliquely directed towards the wall of the wash-tub for the special purpose of imparting a proper circular motion to the washing liquid and the laundry contained in said wash-tub.

My invention consists furthermore in providing in front of the suction aperture of the pump circuit a perforated wall of such size and at such distance from said aperture that the velocity of flow of the washing liquid will be very small in the direction of said aperture. In consequence thereof the effect of suction which is exerted by the jet discharging from said aperture upon the several parts of the laundry will likewise be very small in the direction of said aperture. The perforated wall is essentially of even height with the wash-tub and is also made of proper width, so that the effect of suction exerted by the jet discharging from said aperture will in no way be affected even in case pieces of laundry should eventually be positioned closely in front of said perforated wall.

A further feature of my invention consists in providing auxiliaries for preventing an undue decrease of the suction effect. I attain this by positioning the aforementioned perforated wall at an acute angle to that part of the wall of the wash-tub at which the discharge aperture of the pump circuit is positioned. In other words, the said perforated wall is made to extend about in tangential direction to the circular motion which is imparted to the laundry and washing liquid in the tub by action of the jet of water discharging from said discharge aperture of the pump circuit. From this it follows that the circular motion of the washing liquid will permanently tend to move pieces of laundry which may eventually stick to said aperture away from the latter.

Further features of my invention will appear as the specification proceeds.

In the drawings I have represented a preferred embodiment of a washing machine constructed according to my present invention, Fig. 1 being a side-view, partly in section, of my new washing machine showing some parts of the machine broken away, Fig.

2 an horizontal section taken along the line A—B of Fig. 1, Fig. 3 another view of the machine taken towards the side of the motor which serves for driving the circulating pump, and Fig. 4 is a detail view of the oblique perforated wall which as above mentioned is provided according to my invention within the wash-tub in front of the suction aperture of the pump circuit.

Referring now more particularly to the drawings, the wash-tub *a* of the washing machine is equipped with an extension in the form of a casing *b* containing the circulating pump *c*. The pump circuit has its suction aperture at c_1, a connecting pipe *d* forming the discharge aperture leading into the tub *a*. In front of the aperture *e* which is positioned intermediate the casing *b* and the wash-tub *a* and provided in the wall of the latter there is positioned a perforated wall *g* which forms an acute angle with the suction aperture of the pump in the wall of the tub *a*. The part of the wall *g* which is facing the aperture *e* is not perforated and provided at its under end with a quadrangular aperture *f*, the connecting discharge pipe *d* of the circulating pump leading into said aperture *f*. The remaining part of the wall *g* is provided with sieve-like perforations g_1 and bent rectangularly towards the front wall of the wash-tub. The perforated wall *g* at its one end will thus be directed essentially tangentially to the direction of flow of the jet of water which comes from the pump and enters the wash-tub, that is essentially parallelly to the lateral walls of the tub *a*. On the vertical margins of said wall *g* there is provided a guide ledge *h* and *i* which serves for keeping said wall in proper position during operation of the machine and permitting said wall to be taken out of the wash-tub, for purposes of cleaning the latter. Adjacent to the wall *g* there is provided an aperture *k*, as shown in Fig. 3, at the upper part of the wall of the wash-tub *a*, said aperture serving for connecting a fresh water conduit with said wash-tub. In like manner a pipe stud *k'*, as shown in Figs. 1 and 3, may be used, said pipe stud projecting into the wash-tub *a*. In addition to this, a discharge pipe *j* is provided in the front wall of the wash-tub at the upper part thereof. The pump casing *c* proper enlarges towards above in the form of a funnel and is carried at its rim *r* by the casing *b*. Screw bolts *s* serve for fixing the pump casing proper upon the casing *g*. Above the pump there is arranged a motor *l* which is fixedly connected to the funnel-shaped pump casing by means of the rods *m*. The motor shaft *n* is immediately carrying the blades of the pump *c*. The motor rests by means of supports *t* upon the pump casing *c* in such a manner that an air-space *u* will be provided intermediate said motor and said pump casing *c*. The casing of the motor is covered up by a cap *o* which contains ventilating apertures *p* at its under rim.

A drain-cock *q* as shown in Fig. 3 serves for letting off the water from the wash-tub, said drain-cock being preferably mounted in the wall of the casing *b*.

I desire to be understood that my new washing machine may be constructed different from the construction described herein and shown in the drawings, without departing from the principles of my present invention and without sacrificing any advantages thereof. For instance, the several parts of the machine may be dimensioned differently from the way they are shown in the drawings. Also the perforated wall *g* may be of a form and perforated different from that described hereinabove and shown in the drawings.

The mode of operation of my new washing machine will be immediately apparent from the above given description of the construction of the machine and a special explanation of the mode of operation of the machine is therefore not deemed necessary.

I claim:

1. In a washing machine for clothes, a vertically disposed substantially cubical shaped tub having a lateral adjoining extension casing with rotary means therein, a vertically disposed, perforated partition wall in engagement with two meeting walls of said tub to provide a clearance chamber to permit the passage of wash liquid therethrough, one of said walls having an inlet opening intermediate said partition and the extension casing, and a discharge conduit from said casing leading to the tub and so positioned that a stream of liquid will be injected into the tub adjacent one end of the partition at high velocities in a direction to set up a rotary action of the wash liquid about the vertical axis of the tub, whereby to force the clothes against the sides of the tub, said incoming stream tangentially striking the rotary moving liquid within the tube and said partition being inclined toward the incoming stream and adapted to deflect the circulating clothing directly into the path of the incoming stream.

2. In a washing machine for clothes, a vertically disposed cubical shaped tub, having a lateral adjoining casing, with rotary means therein extending from one of its side walls, said side wall having an inlet and outlet opening, a perforated partition engaged at an acute angle to said side wall and one of the face walls to provide a clothes free chamber between the casing and the remainder of the tub to permit escape of the wash liquid from the tub into the casing and tangentially disposed to the circular motion of the wash liquid, and a discharge conduit in the casing disposed at an acute angle with the inlet

opening of the side wall of said tub whereby the stream of wash liquid injected into the tub will set up rotation of the liquid therein around the vertical axis of the tub, said stream entering the rotating liquid in the tub at a tangent to cause the clothes in the tub to strike against the walls and partition of the tub.

In testimony whereof I have affixed my signature.

ERICH GUSTAV HUZENLAUB.